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ENTOMOLOGICAL NEWS

JANUARY 1949

Vol. LX No. 1

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ENTOMOLOGICAL NEWS

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Xiphocentronidae, a New Family of Trichoptera

By HERBERT H. ROSS, Illinois State Natural History Survey, Urbana, Illinois

In collections made by Mr. Harry Hoogstraal during his 1940 expedition to Mexico are a few specimens of a most unusual small black caddisfly. This species combines characters which were formerly considered distinctive for three families, the Rhyacophilidae, Philopotamidae, and Psychomyiidae—such a mixture of characters that at first I was unable to place the species at all. Finally it was tracked to Brauer's long lost genus *Xiphocentron* and it now appears necessary to erect a new family for its reception. During the course of preparation of this paper, a second species of the genus from southern China was sent to me by Dr. E. S. Ross.

Xiphocentronidae new family

Characteristics.—Size moderate, body fairly slender. Antennae reaching to about end of abdomen. Maxillary palps of both sexes 5-segmented, fig. 6, the two basal segments short, the third subequal to the first two together, the fourth one and a half times the third, the fifth long, whiplike and multi-segmented, as long as the third and fourth combined. Labial palps with two basal segments short, third longer and multi-segmented. Dorsum of head with no ocelli, but with three pairs of prominent warts and sutures as shown in fig. 5. Mesopraescutum well delineated with sutures, elongate, the sides converging posteriad and the posterior margin truncate, fig. 9. Legs elongate, spurs 2–4–3 in the male, 2–4–4 in the female. Wings narrow, the venation reduced, figs. 1–4. Female abdomen ending in an

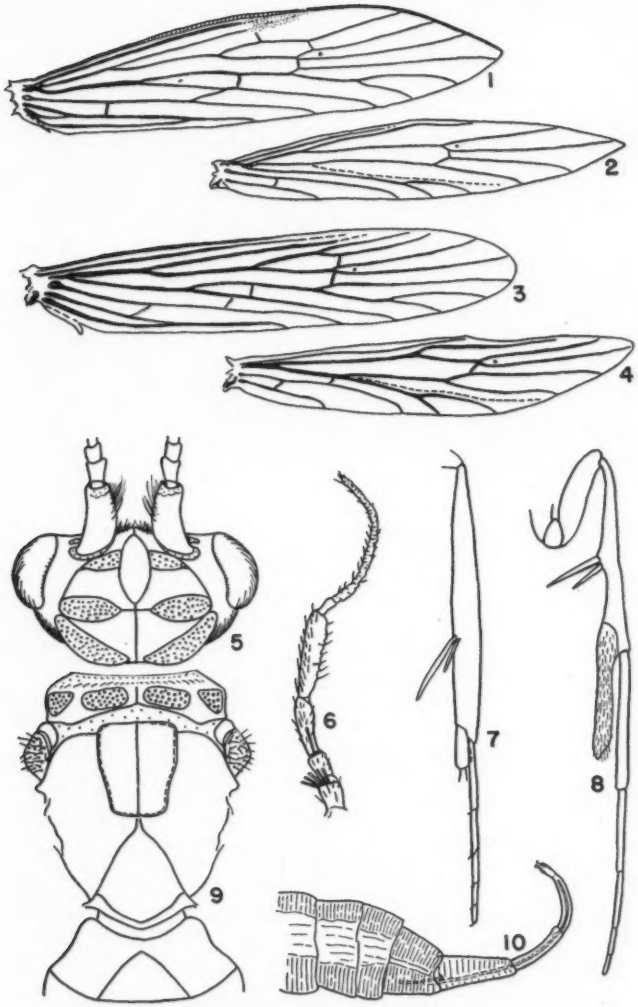
extensile narrow ovipositor, fig. 10. Male genitalia highly developed and complicated, figs. 11, 12.

Familiotype.—*Xiphocentron* Brauer.

The affinities of this family are complicated. The well-developed mesopraescutum and female ovipositor indicate a strong affinity with the Rhyacophilidae; the head sutures and multi-segmented terminal segment of the palps would indicate close relationship with the Philopotamidae; and the lack of ocelli and various characters of the male genitalia, especially the reduced ninth tergite, distinct cerci, and 1-segmented claspers, indicate an alliance with the Psychomyiidae. Looking at these data from the opposite viewpoint we find that the Xiphocentronidae differ from the Rhyacophilidae in having multi-segmented terminal segments of the palps and in lacking ocelli; from the Philopotamidae in lacking ocelli and in having a distinct mesopraescutal sclerite and a female ovipositor; and from the Psychomyiidae in having prominent head sutures, mesopraescutum, and a female ovipositor. The Xiphocentronidae may well be close to the ancestral stock of the Psychomyiidae. If so, this branch must have arisen from the philopotamid stem before the praescutum was lost, and after the division of the two lines the Xiphocentronidae lost their ocelli but preserved the praescutum while the Philopotamidae preserved their ocelli but lost the praescutum. The larvae of the Xiphocentronidae have not yet been found, but will doubtless throw additional light on the relationships of this group.

This new family may be oriented with other families having the multi-segmented terminal segment of the palps by this table:

1. Ocelli present.....**Philopotamidae, Stenopsychidae**
   Ocelli absent.....2
2. Mesopraescutum set off by distinct sutures, fig. 9
   Xiphocentronidae
   Mesopraescutum fused with scutum, its sutures completely obliterated; in Psychomyiidae a small pair of scutal warts present, one on each side of meson just anterior to scutellum.....**Psychomyiidae, Hydropsychidae**



Parts of *Xiphocentron*

X. hwangi: 1, front wing; 2, hind wing.
X. mexico: 3, front wing; 4, hind wing; 5, head, dorsal aspect; 6, maxillary palpus; 7, male hind tibia and tarsi; 9, thorax, dorsal aspect; 10, apex of abdomen, lateral aspect.
X. bilimekii: 8, male hind leg (after Brauer).

Xiphocentron Brauer

Xiphocentron Brauer (1870, Verh. Zool. Bot. Gesell. Wien 20: 66; 1871, *ibid.* 21: 103, pl. 2); Ulmer (1907, Gen. Insect. 60: 176, figs. 217*a, b*). Genotype, monobasic.—*Xiphocentron bilimekii* Brauer.

Of the three species considered as belonging to this genus, I have seen specimens of only the two new ones. To my knowledge, the genotype is known only by Brauer's illustrations. These show characters of venation, tibial spurs, and shape of male genitalia so in agreement with these structures in the other two species that there seems no doubt of the relationship and association.

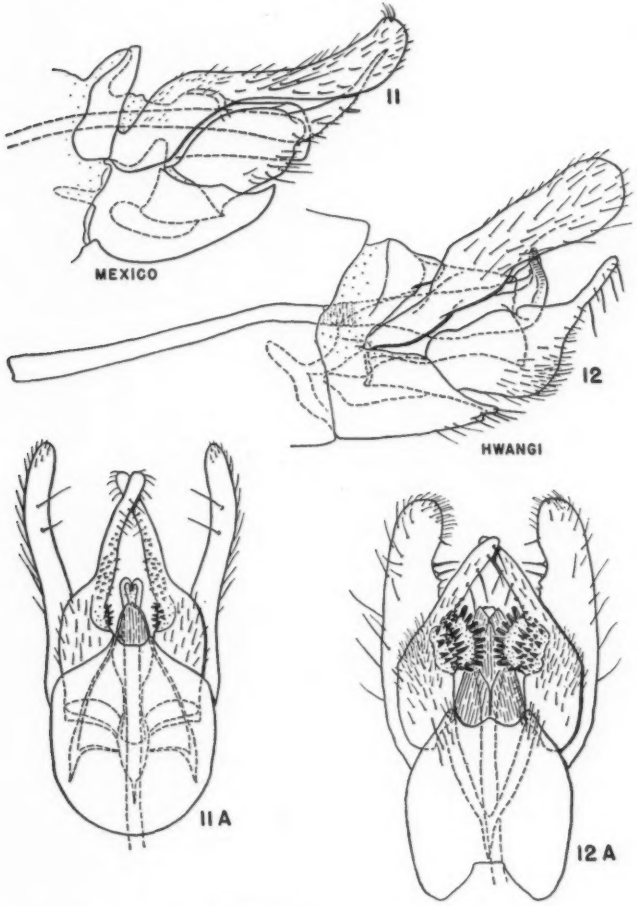
It is interesting that the members of this small, primitive family are widely separated geographically, two from Mexico and one from China. This could indicate a separation of considerable geologic time. As a matter of fact, the Chinese species shows considerable difference from the Mexican in wing venation and male tibial spurs, and the two groups may ultimately be considered as generically distinct. The two show such close affinity in genitalia, however, that I prefer to follow a broader generic concept until more information about the fauna indicates the desirability of a change in status.

Key to species—males

1. Apical spur of hind tibia at least half as long as tibia, fig. 8. Known from Mexico ..... **bilimekii**
   Apical spur of hind tibia less than a fourth as long as tibia, fig. 7 2
2. Clasper with a large oval ring of black spines on meson at point of narrowing, the mesal spines flat and truncate and forming a fairly regular comb, fig. 12*A*. Known from China ..... **hwangi**
   Claspers with only an irregular patch of much shorter spines on meson at point of narrowing, fig. 11*A*. Known from Mexico ..... **mexico**

Xiphocentron mexico new species

Male. Length from tip of head to tip of folded wings, 6.5 mm. Color dark brown, lighter along the sutures and on the venter, the wings with light brown membrane and brown pubescence.



Male Genitalia of *Xiphocentron*
X. mexico: 11, lateral aspect; 11A, ventral aspect.
X. hwangi: 12, lateral aspect; 12A, ventral aspect.

General characteristics as described above under family or genus. Hind tibia with apical spur wide and flat, bearing two spines at

apex, and only about one-seventh as long as tibia, fig. 7. Wing venation illustrated in figs. 3, 4.

Genitalia as in fig. 11. Ninth tergite forming a high, short, and somewhat hood-like sclerite, ninth sternite long, forming a round sclerite beneath the claspers, narrowed and excavated at apex. Tenth tergite represented by a series of membranous folds above the aedeagus. Cercus long and sinuate, up- and in-curved at apex, only sparsely haired. Clasper 1-segmented, the base large and robust, the apex elongate and ribbon-like; the mesal margin, fig. 11*A*, bears a cluster of short, sharp teeth at base of narrowed portion, the latter bearing a series of scattered, shorter ventro-mesal teeth to slightly beyond the middle. Aedeagus tubular and elongate, extending into the seventh or sixth segment, the apex little modified. Internally there is a series of sclerotized braces connecting cerci, claspers, and aedeagus guides.

Female. Similar in size, color, and general structure to male, differing chiefly in spur count, which is 2–4–4, spurs of front tibia short, hind tibia with outer apical spur twice as long as inner spur. Apex of abdomen simple, fig. 10, the terminal segments forming a slender, extensile tube.

Holotype, male.—Villa Santiago, Nueva Leon, MEXICO, elev. 2,500 ft., June 22, 1940, H. Hoogstraal. *Allotype,* female.—Same data. In the collection of the Illinois Natural History Survey.

Xiphocentron hwangi new species

Male. Length 7.0 mm. Color dark brown, slightly lighter on the venter, the wings covered with dense, matlike, and very dark hair. General structure as for genus. Hind tibia with apical spur elongate and slender, a fifth as long as tibia. Wings, figs. 1, 2, sharply pointed, the front wings with costa greatly thickened, both wings with the venation differing in several details from that of *mexico* as shown in figs. 1–4. Genitalia, fig. 12, with ninth tergite short, produced on each side into an ovate lobe; ninth sternite much larger, the apex incised to form a mesal and a pair of lateral processes, fig. 12*A*. Tenth tergite

membranous. Cercus elongate, the base narrow, the apical portion wide, thin, and rounded at apex, sparsely haired. Clasper with broad base, apical portion forming a flattened, finger-like, slender process bearing a ventral row of long, down-pointed setae; the mesal margin at base of "finger" bears an oval membranous area on which is situated an irregular circle of stout, black spines, the lateral ones pointed, the mesal ones truncate and forming a peglike comb. Aedeagus with basal portion very long and slender, this joining a crinkly neck area, the apical portion beyond this enlarging and ending in an up-turned sclerotized portion. Internal connecting rods complex.

Female. Size 6.5 mm. Similar in color and general structure to male. Hind tibia with two apical spurs, the outer one twice length of inner. Apex of abdomen tubular, as in *mexico*.

Holotype, male.—Tung-lu, CHINA, April, 1926, Mrs. Dora E. Wright. In the collection of the California Academy of Science. *Allotype,* female, and 18 ♂ and 2 ♀ *paratypes.*—Same data, deposited in the collections of the California Academy of Science and the Illinois Natural History Survey.

The Present Status of the Distribution of Vespa crabro var. germana Christ in North America [1]

By Prof. M. W. WING, Department of Zoology and Entomology, North Carolina State College, Raleigh, North Carolina

Vespa crabro var. *germana* Christ, the common hornet of Europe, was introduced into North America in the middle of the nineteenth century. H. de Saussure (Ent. News 9: 145, 1898) reported that it was captured in 1854 in the eastern United States. J. Bequaert (Ent. Amer., N.S., 12 (2): 86, 1931) reported that J. Angus, in 1871, stated that this hornet had been common in the vicinity of West Farms, New York, for the past 25 years. It seems probable that southeastern New York State is the focal point from which this powerful wasp has

[1] I wish here to express my thanks to Dr. J. C. Bequaert for his kindness in sending me several records and for critically reading the manuscript and suggesting several improvements.

spread out over a number of the eastern states. In 1931 (J. Bequaert, 1931, *loc. cit.*) this hornet was well established in Long Island, Staten Island, southern New York State, northern New Jersey, and southwestern Connecticut. In addition to this area where the wasp was known to be naturalized, specimens had been taken near Philadelphia, in Maryland, and in Delaware. Dr. Bequaert in this paper also called attention to and discussed several published records, which he considered to be open to question. These records are from the following localities: Illinois, North and South Carolina, and New Orleans.

In 1935, J. Bequaert (Bull. Brooklyn Ent. Soc. 30 (3): 120) reported the spread of this species to southeastern Pennsylvania. In addition to this new area of establishment, a ♂ taken at Norfolk, Virginia, was reported.

In 1941, J. Bequaert (Bull. Brooklyn Ent. Soc. 36 (3): 111) reported the spread of this species to most of New York State, eastern Pennsylvania, Delaware, Maryland and the eastern part of West Virginia. Over and above these additions to the area of establishment, trustworthy records of this wasp from Quebec and North Dakota were given. There was, however, no reason to believe that the last two records indicated anything more than accidental importations.

This species was taken in North Carolina in 1940 (C. S. Brimley, "Supplement to Insects of North Carolina," 1942). Since that time five additional captures have been made in the state. These additional records, based on specimens which I have examined, are: Guilford Co., Sept. 22, 1944, J. A. Harris, 1 ♂ and 3 ♀♀. Greensboro (Guilford Co.), Early Oct., 1946, D. J. Brame, 1 ♀ and a portion of the nest. Reidsville (Rockingham Co.), Sept. 4, 1947, J. E. Foil, 1 ♀. Carthage (Moore Co.), Sept 11, 1947, E. H. Garrison, 1 ♀. Mocksville (Davie Co.), Sept. 15, 1947, J. P. Bowles, 2 ♀♀. The note accompanying these specimens reads "working in hollow tree—busy as a colony of bees."

In considering the 1940 North Carolina Record, a single ♂ taken near the railroad tracks on the State College campus, there appeared to be no reason to believe that this species had

become established in the state, for this individual might well have been brought into this area in a box car from a considerable distance. But when the other five records, two of which are definitely correlated with a nest, are considered, it seems evident that this powerful wasp is now in the process of becoming established in the central portions of this state.

In the light of the North Carolina records, and on the assumption that the presence of this species here was the result of a gradual extension of its range southward, I inferred that this wasp was undoubtedly well established in Virginia. I then wrote Dr. Bequaert requesting any additional records of this species which he might have. He very kindly supplied me with the following records: Fredericksburg, Va.: Dr. Karl V. Krombein found this species nesting here in a hollow locust tree. Limeton, Va.: Dr. Bequaert pointed out the paper of Dr. A. H. Clark (Proc. Biol. Soc. Wash. 52: 179, 1939) which I had overlooked; it reported *V. crabro* from the above-mentioned locality. Summit Co., Ohio: 1 ♂ taken in June 1934 by L. J. Lipovsky.

Dr. Bequaert stated in his letter of July 12, 1948, that Virginia and probably Ohio could now be considered a part of the settled range. He further stated that Quebec, North Dakota, Illinois, South Carolina and New Orleans were still considered by him as doubtful or accidental records.

The present established range of *Vespa crabro* covers the following states (all of the state or a part of it): New York, New Jersey, Connecticut, Pennsylvania, Delaware, Maryland, West Virginia, Virginia, Ohio and North Carolina.

In my opinion, it would seem highly probable that the wasp may be found also in eastern Kentucky, western Massachusetts, and southwestern Vermont. In addition to these probable areas of occurrence, it might extend in the not-distant future to northern South Carolina, eastern Tennessee, southwestern New Hampshire and possibly Rhode Island.

The European hornet typically builds large nests in hollow trees, although other sheltered situations are often utilized, for example, under porches and, in fact, under overhanging roofs of all types. Exceptionally underground cavities are utilized

as a nesting site. In Europe attics and barns are favorite nesting locations. The degree of completeness of the envelope enclosing the nest varies with the situation. In the more exposed aërial nests, this outer nest covering is usually complete; in cavities, nests either completely or partially lack this outer covering envelope. The paper of which the nest is made is very coarse and brittle; its color is a brownish gray. The longer diagonals of the hexagonal brood cells of a nest in my possession measure about 1 cm. Most of these cells have plugs of dark chocolate brown material in their upper, closed ends. These characteristics make it possible to identify accurately the species in this country from the nest alone.

It is hoped that entomologists in the areas outlying the present distribution of this powerful wasp will be on the watch for it, as only collecting on these constantly moving boundaries will give us an accurate timing of the spread of this hornet.

The prediction of J. Bequaert (1941, *loc. cit.*) that "no doubt this powerful insect will eventually spread over most of eastern North America" will in all probability be fulfilled, since the range of this species is being constantly extended.

The Function of the Spur on the Femur of the Palpus of the Male, Leiobunum calcar (Wood) (Arachnida: Phalangida)

By Sherman C. Bishop, Department of Biology, University of Rochester, Rochester, N. Y.

During July and August 1948, I was fortunate in being able to study at the Edmund Niles Huyck Preserve at Rensselaerville, New York, and, taking advantage of an abundance of materials, spent most of the time in observing and collecting phalangids.

Leiobunum calcar (Wood) is a common and widely distributed species, the males of which are easily recognized because of the presence, on the femur of the palpus, of a large, ventrolateral spur. The male palpus is much stouter than that of the female, especially the femur, patella and tibia. The patella is

short, strongly arched above and curved ventrally, the tibia is produced ventrally at the base and curved ventrally on the distal half. The swollen base is armed with short, dark denticles. Because of the shortness of the patella, the spur on the femur may be apposed to the swollen base of the tibia to form an efficient grasping organ.

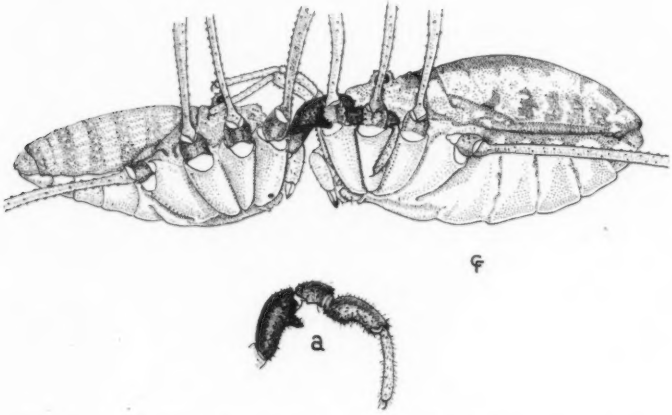


FIG. 1. *Leiobunum calcar*, male (left) and female in mating position. a. Right palpus of male.

Pairs of *L. calcar* may often be seen to mate in the field and when confined continue the practice at frequent intervals. Under the binocular microscope the function of the spur is at once evident. When the male encounters a receptive female, he rushes at her without preliminary courtship and grasps her firmly. The trochanters of the first legs of the female are held between the spurs of the femora and the swollen bases of the tibiae of the male, the curved ventral sides of the patellae of the male fitting the mesal sides of the trochanters of the female. The curved, disto-ventral surfaces of the tibiae of the male fit the mesal sides of the trochanters of the second legs of the female and the tarsi of the male are pressed against the coxae of the second legs of the female.

The drawings were made by Carolyn Fallon.

On Some Centipeds from Northern Alaska

By RALPH V. CHAMBERLIN

The centipeds reported upon in this paper were taken by Dr. Neal A. Weber in August of 1948. One species, Oabius sp., was taken at Whitehorse, Yukon Territory, Canada, and three others from Northern Alaska on the north front of the Brooks range, which, as Dr. Weber notes, "must be a formidable barrier to life coming from the south." The latitude 68°20′ is near the most northerly limit known for chilopods.

Previously reported from localities near or north of the Arctic Circle were the following from the vicinity of the Yenesei River in Siberia, recorded by Stuxberg in 1876.[1]

Lithobius nordenskiöldi Stuxberg (71°40′)
Lithobius vagabundus Stuxberg (66°17′)
Sonibius ostiacorum (Stuxberg) (69°15′)
Nampabius sulcipes (Stuxberg) (66°17′)

From farther east in Siberia at Pitlekay (67°4′ 49″ N. and 173°23′ 2″ W.) on the north shore of the Chukutski peninsula, collectors on the Vega expedition of 1878–79 secured the following two forms.[2]

Monotarsobius crassipes holstii Pocock
Monotarsobius tricalcaratus Attems

Taken at Nanamo, which is also on the Chukutski Peninsula, was:

Arctogeophilus glacialis Attems

Family LITHOBIIDAE

Genus **ESCIMOBIUS** new

Allied to Oabius in having the median and anterior legs with tarsus uniarticulate. It is set apart from Oabius principally in

[1] Stuxberg, Anton. On the Myriopoda from Siberia and Waigatsch Island collected during the Expedition of Prof. Nordenskiold, 1875. Ann. & Mag. of Nat. History, April, 1876.

[2] Attems, Carl Grof Attems. Die Myriopoden der Vega Expedition. Arkiv för Zoologi, 1909, vol. 5, no. 3.

having a definite dorsal keel at the distal end of the fifth joint of the penult legs, with the succeeding two joints abruptly and considerably thinner. Fifth article of penult legs lacking a dorsal spine in the male. Articles of antennae 20. Prosternal teeth 2 + 2. Ocelli few, typically in 2 series.

Generotype: *Escimobius cryophilus* new species.

Escimobius cryophilus new species

Color of dorsum orange or light chestnut, lighter along middorsal area. Antennae orange and legs yellow.

Antennae short, the articles between the second and ultimate especially short; ultimate article longer than the two preceding taken together.

Ocelli 6 in number, in two series; thus 1 + 2,3. The single ocellus largest, pale, while the others are black.

Prosternal teeth 2 + 2.

Ventral spines of first and second legs 0,0,0,1. Ventral spines of penult legs 0,1,3,3,1; dorsal spines 1,0,2,1,0; claws lost from type. Ventral spines of anal legs 0,1,3,2, (?), the joints beyond fourth lost from type; dorsal spines 1,0,2,0,0.

Coxal pores 2,2,3,3, small and circular.

In the male the fifth joint of the penult legs bears at distal end on mesodorsal line a low keel which runs out toward middle of joint.

A mutilated female, agreeing in general characters, so far as evident, with the male holotype, has the claw of the genital forceps short, relatively broad and entire; its basal spines 2 + 2, acutely conical from base to apex.

Length, about 6 mm.

Locality: ALASKA 68 20′ N. lat. and 151 30′ W. long. One male taken by Neal A. Weber, August 20, 1948.

Arebius integrior new species

Dorsum brown with a darker, blackish pigment distributed irregularly in a discontinuous median band and along caudal and lateral borders, especially of the more posterior plates. Antennae irregularly infuscate. Legs dilute yellow, those of pos-

terior region in particular irregularly infuscate, the tarsi a brighter yellow.

Antennae short, articles 20.

Ocelli in two series, typically 3,4, the single ocellus the most caudal of the upper series but not distinctly set off.

Prosternal teeth 2 + 2.

Tarsi of all legs distinctly biarticulate. Ventral spines of first and second legs 0,0,0,0,1; dorsal 0,0,0,1,1. Ventral spines of penult legs 0,1,3,2,(1),1; dorsal 0,0,2,1,0. Ventral spines of anal legs 1,0,2,0,0. Claws of anal and penult legs lost. None of coxae laterally armed. Coxal pores small, 3,4,5,5.

Claw of genital forceps of the female entire, acute; basal spines 2 + 2, these relatively short and thick, the outer one of each pair stouter than the inner one, only a short apical part obtusely acuminate.

Length of female holotype, 9.5 mm.

Locality: ALASKA: 68°20′ N., 151°30′ W. Female *holotype*, with a female *paratype* and male *allotype* which have lost their posterior legs, taken August 26, 1948 (Nos. 2309 and 2319).

Differing from other speices of the genus in lacking a lateral spine on coxae of posterior legs and in the reduced number of ventral spines on the anal legs,—0,1,2,0,0 as against from 0,1,3, 2,1 to 0,1,3,3,1 in other species having the claw of the female genital forceps entire.

Oabius sp.

One adult female 6.2 mm. long was taken at Whitehorse, Yukon Terr., Canada, on August 18, 1948 (N. A. Weber No. 2280). Since all the posterior legs are lost from the specimen it is thought unwise to attempt to refer it to a species. It was taken "under loosely buried wood in sandy soil, with second growth pine beside the airport."

Family SCHENDYLIDAE

Escaryus paucipes Chamberlin

Escaryus paucipes Chamberlin, 1946, Ann. Ent. Soc. Amer., 39: 179; *3,4.

This species was previously known only from the male holotype which was taken by J. C. Chamberlin in August, 1945, at Haines, Alaska. The female here recorded agrees with the male in having the number of pairs of legs 33 and in all other essential features. The cephalic plate, however, differs somewhat in having the sides beyond the caudal third nearly straight or slightly concave instead of more evenly convex.

Locality: ALASKA: 68°20'N., 151°30' W. One male taken August 30, 1948, by Neal A. Weber (No. 2317).

Haunts and Habits of the Dragonfly Oplonaeschna armata

By ERNEST R. TINKHAM, Box 123, Indio, California

We present here, with the author's permission, some field observations of an interesting dragonfly from the canyons of southeastern Arizona; also an account of a successful shipment of two of its nymphs for a long distance without water. These are extracts from three letters written by Dr. Tinkham to Dr. James G. Needham of Cornell University, to whom the living nymphs were sent. The first letter was written in reply to inquiries concerning *Oplonaeschna*.

Benson, Arizona, October 16th, 1947.

On June 14th, 1940, I found two larvae (naiads) of *Oplonaeschna armata* clinging to the under side of a water-logged piece of bark. These were the only ones found. The canyon pools are at the upper edge of what I call the Live Oak Zone of the Upper Sonoran. These pools are formed below big rock boulders and are usually lined with fallen leaves. Some pools are several feet deep and are fed with running water.

After finding the naiads I still had to find a way to transport them safely across the hot desert to Tucson. Years previously in the Big Bend Region of Trans-Pecos Texas I had learned

that water in jars soon heats up and kills the specimens. By 1940 I had conceived a new idea (which may have been used before): I carried them from the Canyon to my car in a wet hankerchief, and transferred them to a waterbag with cool water. They were still in cool water when I reached Tucson the following night. I put a one or two short twigs about 5–6 inches long in the bag to brace the side walls apart, and some days later my two naiads transformed perfectly to adults. I have used this method to transport frogs and fish on the desert, with equal success.

Tucson, Arizona, July 22nd, 1948.

Two days ago I got off for the Huachucas, fortunately, just on the eve of our rainy season. You will be pleased to learn that I have obtained six or seven naiads of *Oplonaeschna* from the upper end of Ramsay Canyon. I used a Chinese wire rake for raking the leaves out of the small pools. On the whole, Oplonaeschnas were very rare. With the exception of finding one larva under a big flat rock at the mouth of a pool, all were taken in small pools that were almost dried up. In one almost dry pool two naiads were clinging to a rock at the mouth end, not near any water. There was a basinful of water in the deep part of the pool but no *Oplonaeschna* naiads were there; there were many Cordulegasters † there. In another completely dried up pool I found three Oplonaeschnas in a mass of leaves at the mouth of the pool where leaves had collected. I believe that these naiads can remain in such places and undergo desiccation for some time.

The naiads play opossum by curling up. I took two photos of this pose.

I am air-mailing to you a pint cardboard carton with two live naiads in it, placed in damp leaves that I took from the pool. I hope they may reach you alive.*

* The two were very much alive on arrival in Ithaca. When I opened the carton on my desk one fell out, ran over the edge and fell into my wastebasket, where I had to chase it around among scraps of loose paper to get it again. J. G. N.

† *Cordulegaster diadema.*

Indio, California, December 5, 1948.

On July 26, 1948, I took off on my expedition to the Great Basin Desert. On the front of my army carry-all hung a desert water bag containing two living half-grown naiads of *Oplonaeschna armata*. I took these along with me in hopes that one or both might mature and emerge during my study trip. Between July 26 and August 22, I travelled 3,100 miles through the deserts of southeastern Utah, Great Salt Lake Basin northwest of Great Salt Lake, northern Nevada, and back to Tucson; and the naiads were as lively at the end of the ardous journey as at the commencement a month before. During this period they had no food. Unfortunately on September 11–12 I had to make a bus trip to southern California and upon my return discovered that the water bag had dried out from lack of attention and my two *Oplonaeschna* naiads were dead and desiccated. On several other occasions the water was gone in the bag but the naiads survived but this time the bag dried out completely and they perished. However these facts show that they are unusually well adapted to the vicissitudes of life in the wooded canyons of southeastern Arizona. There almost any summer they must hide amongst the clumps of damp leaves in drying out pools awaiting the summer rains that will send water running down again.

New Ant Hosts of the Fungus, Laboulbenia formicarum Thaxter

M. R. Smith (*Proc. Ent. Soc. Wash.*, vol. 48, 1946: 29–31) published a list of 18 different forms of ants known to be hosts of *Laboulbenia formicarum* Thaxter in the United States. I have seen the fungus on two additional forms, namely *Lasius niger* var. *sitkaensis* Pergande (all castes, collected at Logan, Utah by G. F. Knowlton) and *Formica parcipappa* Cole (collected at Nampa, Idaho by the writer).

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Current Entomological Literature

COMPILED BY RAYMOND Q. BLISS AND R. G. SCHMIEDER.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the year 1948 unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For other records of general literature and for economic literature see the Bibliography of Agriculture, Washington, and the Review of Applied Entomology, Series A, London. For records of papers on medical entomology see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of periodicals and serials published in our January and June issues. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Anon.—Obituaries: Benjamin G. Pratt. [34] 41: 840–41. Arthur Gordon Ruggles. *Ibid.:* 841–42. **Aitken, T. H. G.**—Recovery of Anopheline eggs from natural habitats, an aid to rapid survey work. [5] 41: 327–29. **Atkins, E. L., Jr.**—Mimicry between the drone-fly, Eristalis tenax, and the honeybee, Apis mellifera. Its significance in ancient mythology and present-day thought. [5] 41: 387–92. **Arthur, D. R.**—Some aspects of the ecology of the tick, Ixodes ricinus L., in Wales. [19] 39: 321–37. **Cross, H. F.**—Use of powders on clothing for protection against chiggers. [37] 41: 731–34. **Eichler, W.**—Evolutionsfragen der Wirtsspezifität. [Biol. Zentralbl.] 67: 373–406. **Essig, E. O.**—Insect surveys in relation to quarantine and control of insect pests. [37] 41: 673–77. **Finney, G. L.**—Culturing Chrysopa californica and obtaining eggs for field distribution. [37] 41: 719–21. **Hafez, M.**—A simple method for breeding the house-fly Musca domestica in the laboratory. [19] 39: 385–86. **Hartzell, F. Z.**—Obituary: Hugh Glasgow. [34] 41: 837–38. Samuel Willard Harman. *Ibid.:* 838–39. **Jucci, C.**—Francesco Pio Pomini (1915–1941) (Obituary). [Sci., Genetica, Torino, Italy] 2: 103–07, 1942. **Kennedy, C. H.**—Myrmecological technique. III. DDT too perfect an ant killer for the collectors' use. [58] 48: 248–49. **Knowlton and Nye**—Insect food of the vesper sparrow. [37] 41: 821. **Linduska and Morton**—Tests of the permeability of fabrics to biting by mosquitoes. [37] 41: 788–94. **Osborn, H.**—Recent insect invasions of Ohio. [Ohio Biol. Surv.] Bull. 40 (vol. 7): 357–58. **Phil-**

lips, M. E.—A brief history of Academy (Nat. Sci. Phila.) publications. [62] C: i–xl. **Satterthwait, A. F.**—Important sunflower insects and their insect enemies. [37] 41: 725–31. **Schwanwitsch, B. N.**—Evolution of the wing-pattern in Palaearctic Sytyridae. IV. Polymorphic radiation and parallelism. [Acta Zool.] 29: 1–61. **Smith, R. C.**—The doctor's degree. [34] 41: 843–45. **Steiner, H.**—Die Bindung der Hochmoorlibelle Leucorrhinia dubia an ihren Biotop. [Zool. Jahrb., Abt. System.] 78: 65–96. **Swezey, O. H.**—Insect invaders in Hawaii during and since World War II. [37] 41: 669–72. **Timofeeff-Ressowsky, N. W.**—Sulla questione dell'isolamento territoriale entro popolazioni specifiche. [Sci. Genetica] 1: 76–85, 1939. Genetica ed evoluzione. *Ibid.:* 278–81. Sulla questione dell'isolamento biologico entro popolazioni specifiche. *Ibid.:* 317–25. **Vogt, G. B.**—Dermestes and Saprinus as predators and pests in fleshfly rearing. [37] 41: 826–27.

ANATOMY, PHYSIOLOGY, MEDICAL—Bateman, A. J.—Intra-sexual selection in Drosophila. [Heredity] 2: 349–68. **Beament, J. W. L.**—The penetration of the insect egg-shells. I. Penetration of the chorion of Rhodnius prolixus. [19] 39: 359–83. **Becker, G.**—Über Kastenbildung und Umwelteinfluss bei Termiten. [Biol., Zentralbl.] 67: 407–44. **Bick, G. H.**—Resistance of Culex quinquefasciatus larvae and pupa to experimental drought. [5] 41: 360–68. **Blumel and Kirby**—Amino acid constituents of tissue and isolated chromosomes of Drosophila. [67] 34: 561–66. **Bonnemaison, L.**—Determination du stade auquel se produit de déclenchement de la diapause chez un hémiptère: Eurydema ornatum L. [C. R. Acad. Sci., Paris] 227: 1054–54. Remarques sur la diapause chez un hemiptere: Eurydema ornatum. *Ibid.:* 985–86. **Broadbent, L.**—Aphis migration and the efficiency of the trapping method. [4] 35: 379–94. **Bruce, W. N.**—Studies on the biological requirements of the cat flea. [5] 41: 346–52. **Browning, H. C., F. C. Fraser, S. K. Shapiro, I. Glickman and M. Dubrule**—The biological activity of DDT and related compounds. [24] 26: 282–300. **Browning, H. C., S. K. Shapiro and M. Dubrule**—The insecticidal activity of DDT and related compounds. [24] 26: 301–06. **Bucher, G. E.**—The anatomy of Monodontomerus dentipes, an entomophagus chalcid. [24] 26: 230–81, ill. **Buzzati-Traverso, A.**—Genetica di popolazioni in Drosophila. I, II, III. [Sci., Genetica] 2: 190–251, 1942. **Cavalconti, A. G. L.**—Geographic variation of chromosome structure in Drosophila prosaltans. [Genetics]

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HYMENOPTERA—Atkins, E. L., Jr.—(See under General.) **Bromley, J. W.**—(See under Diptera.) **Brown, W. L., Jr.**—A preliminary generic revision of the higher Dacetini (Formic.). [83] 74: 101–29 (k*). **De Santis, L.**—Un caso interesante de foresia (Grassator viator, Chalcid.: Entedontid.). [Notas Mus. de la Plata] 13: 129–35, ill. (S*). **Doucette, C. F.**—(See under Coleoptera.) **Kennedy, C. H.**—(See under General.) **Lyle and Fortune**—Notes on an imported fire ant. [37] 41: 833–34. **Munro and Post**—(See under Coleoptera.) **Narayanan** et al.—(See under Anatomy.) **Pardi, L.**—(See under Anatomy.) **Rau, P.**—A note on the nesting habits of the wasp, Pemphredon inornatus. [5] 41: 326. **Smith, M. R.**—A new species of Myrmecine from California (Formic.). [65] 50: 238–40 (k). **Whiting, A. R.**—(See under Anatomy.)

NOTICE. The December 1948 issue of ENTOMOLOGICAL NEWS was mailed at the Post Office at Lancaster, Pa., on February 17, 1949.

List of Titles of Publications Referred to by Numbers in Entomological Literature in Entomological News.

1. American Midland Naturalist. Notre Dame, Indiana.
2. American Museum Novitates. New York, N. Y.
3. American Naturalist. Garrison-on-Hudson, New York.
4. Annals of Applied Biology. London.
5. Annals of the Entomological Society of America. Columbus, Ohio.
6. Annals and Magazine of Natural History. London.
7. Annales Academia Brasileira Sciencias. Rio de Janeiro.
8. Anales del Instituto de Biologia Mexico. Mexico City.
9. Anatomical Record. Philadelphia.
10. Arkiv för Zoologie. K. Svenska Vetenkapsakademien i. Stockholm.
11. Arquivos de Higiene e Saude Publica. São Paulo.
12. Biological Bulletin. Woods Hole, Massachusetts.
13. Bios, Rivista Biol. Geneva.
14. Boletin de Entomologia Venezolana. Caracas.
15. Boletin del Museo de Historia Natural "Javier Prado." Lima, Peru
16. Boletin do Museu Nacional do Rio de Janeiro. Brasil.
17. Bull. Acad. Sci. (Izvestia Akad. nauk) U S S R (S. biol.).
18. Bulletin of the Brooklyn Entomological Society. New York.
19. Bulletin of Entomological Research. London.
20. Bulletin of the Museum of Comparative Zoology. Cambridge, Mass.
21. Bulletin of the Southern California Acad. of Sciences. Los Angeles.
22. C. r. Acad. Sci. (Doklady Akad. nauk) U S S R. Leningrad.
23. Canadian Entomologist. Guelph, Canada.
24. Canadian Journal of Research. Ottawa, Canada.
25. Ecological Monographs. Durham, North Carolina.
26. Ecology. Durham, North Carolina.
27. Entomologica Americana. Brooklyn Ent. Society, New York.
28. Entomological Monthly Magazine. London.
29. Entomological Record and Journal of Variations. London.
30. The Entomologist. London.
31. Florida Entomologist. Gainesville, Florida.
32. Frontiers. Philadelphia, Pennsylvania.
33. Great Basin Naturalist. Provo, Utah.
34. Iowa State College Journal of Science. Ames, Iowa.
35. Journal of Agricultural Research. Washington, D. C.
36. Journal of Animal Ecology. London.
37. Journal of Economic Entomology. Geneva, New York.
38. Journal of the Elisha Mitchell Science Society. Chapel Hill, N. C.
39. Journal of Entomology and Zoology. Claremont, California.
40. Journal of Experimental Biology. London.
41. Journal of Experimental Zoology. Philadelphia, Pennsylvania.
42. Journal of Heredity. Baltimore, Maryland.
43. Journal of the Kansas Entomological Society. Lawrence, Kansas.
44. Journal of Morphology. Philadelphia, Pennsylvania.
45. Journal of the New York Entomological Society. New York.
46. Journal of Parasitology. New York.
47. Journal of the Tennessee Academy of Sciences. Nashville, Tenn.
48. Journal of the Washington Academy of Sciences. Washington, D. C.
49. Memorias do Instituto Oswaldo Cruz. Rio de Janeiro.
50. Microentomology. Stanford University, California.
51. The Microscope and Entomological Monthly. London.
52. Mosquito News. Albany, New York.
53. Nature. London.
54. Nature. Washington, D. C.
55. La Naturaliste Canadien. Quebec.
56. Natural History. New York.

57. Occasional Papers, Mus. of Zool., Univ. of Michigan. Ann Arbor.
58. Ohio Journal of Science. Columbus, Ohio.
59. Opinions and Declarations. Intern. Com. Zool. Nomencl. London.
60. Pan-Pacific Entomologist. San Francisco, California.
61. Parasitology. London.
62. Proceedings of the Academy of Natural Sciences. Philadelphia.
63. Proceedings of the Biological Society of Washington. Washington, D. C.
64. Proceedings of the California Academy of Science. San Francisco
65. Proceedings of the Entom. Soc. of Washington. Washington, D. C
66. Proceedings of the Hawaiian Entomological Society. Honolulu.
67. Proceedings of the National Acad. of Sciences. Washington, D. C.
68. Proceedings of the Royal Entomological Society of London. Ser. A.
69. Proceedings of the Royal Entomological Society of London. Ser. B.
70. Proceedings of the Royal Entomological Society of London. Ser. C.
71. Proceedings of the U. S. National Museum. Washington, D. C.
72. Proceedings of the Zoological Society of London. London.
73. Psyche, A Journal of Entomology. Boston, Massachusetts.
74. Quarterly Journal of Microscopical Science. London.
75. Quarterly Review of Biology. Baltimore, Maryland.
76. Revista Academia Columbiana de Cien Exact. Fis. y Nat. Bogotá.
77. Revista Chilena de Historia Natural. Valparaiso, Chile.
78. Revista Instituto Salubridad y Enfermedades Tropicales. Mexico.
79. Revista Sociedad Mexicana de Historia Natural. Mexico City.
80. Science. Washington, D. C.
81. Scientific Monthly. New York.
82. Smithsonian Miscellaneous Collections. Washington, D. C.
83. Transactions of the American Entomological Society. Philadelphia.
84. Transactions of the Amer. Micros. Soc. Menasha, Wisconsin.
85. Transactions of the Illinois State Academy of Sciences. Springfield.
86. Transactions of the Kansas Acad. of Sci. Manhattan, Kansas.
87. Transactions of the Royal Canadian Institute. Toronto.
88. Transactions of the Royal Entomological Society. London.
89. U. S. Dept. of Agric., Farmer's Bulletins. Washington, D. C.
90. U. S. Dept. of Agric., Technical Bulletins. Washington, D. C.
91. University of California Publications in Entomology. Berkeley.
92. University of California Publications in Zoology. Berkeley.
93. University of Kansas, Science Bulletins. Lawrence, Kansas.
94. Ward's Natural Science Bulletin. Rochester, New York.
95. Zoologica. New York.
96. American Journal of Public Health. Boston.
97. American Journal of Tropical Medicine. Baltimore.
98. Annals of Tropical Medicine and Parasitology. Liverpool.
99. Canadian Journal of Research. Section E, Medical Sciences, Ottawa.
100. Evolution. New York.
101. Mitteilungen der schweitzerischen entomologischen Gesellschaft, Bern.
102. Revue de Entomologie. Rio de Janeiro, Brasil.
103. Proceedings of the Royal Society of London.
104. Anales de la Escuela Nacional de Ciencias Biologicas. Mexico.
105. Journal of Cellular and Comparative Physiology. Philadelphia.
106. Redia. Florence, Italy.
107. Annales de la Société Entomologique de France. Paris.
108. Bulletin de la Société Entomologique de France. Paris.
109. Notulae Naturae. Philadelphia.
110. L'Entomologiste. Paris.
111. Revista Brasiliera de Biologie. Rio de Janeiro.
112. Eos, Revista Española de Entomologia. Madrid.
113. Minist. de Agri. de la Nación, Inst. Sanidad Vegetal, Buenos Aires.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Meliponidae—Wanted, information on the bionomics, culture, and economic importance of the stingless bees, particularly of the Old World. P. Nogueira Neto, Av Cicade Jardim 170, S. Paulo, Brasil.

Wasps (Vespoidea, Sphecoidea, Chrysidoidea) of the world by exchange or purchase. Will collect other orders in exchange. D. G. Shappirio, 4811 17th St., N.W., Washington 11, D. C.

Lepidoptera—Large quantities of Plexippus, Colias, Cardui, Vanillae wanted for cash or exchange for tropical butterflies. G. MacBean, 710 Miller Rd., Sea Island, Vancouver, B. C.

Ants of the tribe Dacetini (*Strumigenys, Rhopalothrix* and related genera) wanted for world revision. W. L. Brown, Jr., Harvard University Biological Laboratories, Cambridge 38, Mass.

Mallophaga (on which immediate determination is not necessary) wanted for study and determination. R. L. Edwards, Dept. Biology. Harvard University, Cambridge 38, Mass.

Tingidae (Heteroptera) of the world wanted, in alcohol, with host and other ecological data. Will collect other orders in exchange. N. S. Bailey, 16 Neponset Ave., Hyde Park 36, Mass.

Bombidae, nearctic and neotropical, wanted for exchange, identification, or purchase. Will exchange in other groups for bumblebees. Barth Maina, Dept. Zool., Univ. of Chicago, Chicago 37, Ill.

Saturnidae of the world. Will purchase individual specimens or cocoons. F. E. Rutkowski, St. Bede College, Peru, Illinois, U. S. A.

Butterflies of New England, principally from New Haven, Conn., for exchange. Louis Clarke, 28 W. Elm St., New Haven 15, Conn.

Wanted—Proc. Ent. Soc. Phila., vols. 1-6; Proc. Cal. Acad. (Nat.) Sci., 1-7; Proc. Acad. Nat. Sci. Phila., 1-20; Trans. Amer. Ent. Soc., 1-10; Bull. Buff. Soc. Nat. Sci., 1-5; Psyche, 11, 13, 15; Ent. Amer. n.s., 7-26. C. F. dos Passos, Mendham, N. J.

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